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ON THE APPLICATION OF

VULCANIZED INDIA RUBBER

FOR

MAKING ARTIFICIAL PALATES,

ETC., ETC.

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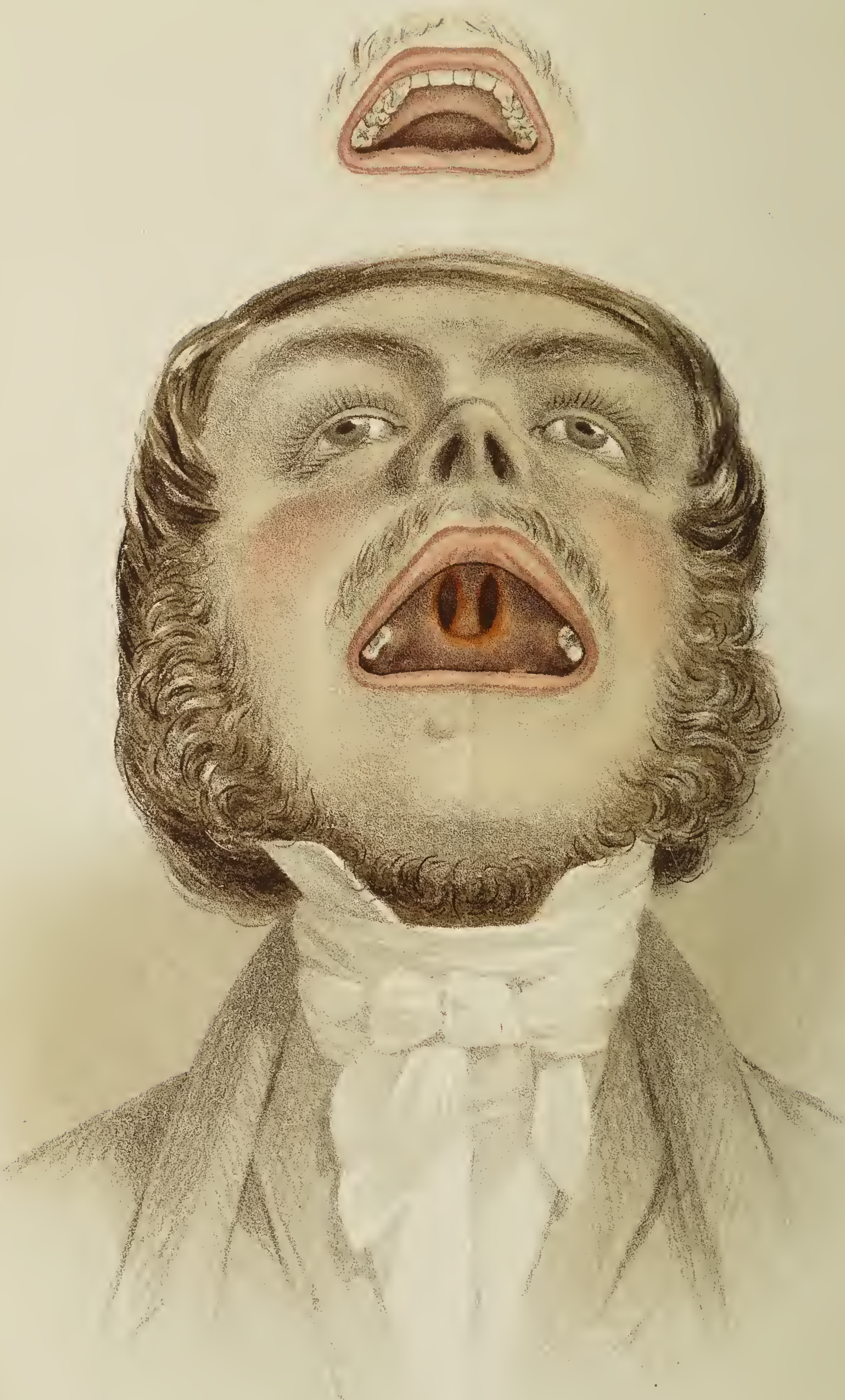

^{r} Westmacott. ad Nat.^{m} Del.^{t} Maii, 1860.

Vincent Brooks, lith. King St Covent Garden.

Case. IX.

ON THE APPLICATION OF VULCANIZED INDIA RUBBER FOR MAKING ARTIFICIAL PALATES, AND FOR SUPPLYING THE DEFICIENCIES IN JAWS CAUSED BY SURGICAL OPERATIONS FOR THE REMOVAL OF DISEASE.

BY

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PREFACE.

The following remarks, illustrated with cases, have been hastily put together with the view of furnishing a ready answer to the numerous inquiries continually being made to me by many of my friends, as to whether patients afflicted with fissures in the hard or soft palate, or in both, are capable of having relief afforded to them by mechanical means.

I would also take this opportunity of thanking Mr. Fergusson, Mr. Christopher Heath, and other gentlemen who kindly furnished me with those patients upon whom I first fitted the vulcanized india-rubber palates—a proceeding which has been attended with the most complete success.

16, *Hereford Street,*
Park Lane, W.

ON THE APPLICATION OF

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HAVING given considerable attention to the mechanical contrivances for the relief of patients suffering from clefts in the palate and deficiencies in the jaw, whether congenital or caused by operative treatment for the removal of disease, I am induced to record my experience, stating the methods I have adopted, and the success which has attended my endeavours.

I shall, however, preface my remarks by briefly alluding to what has already been accomplished, both surgically and mechanically, by others.

There are few malformations which are more distressing to the patient than clefts in the palate, particularly when this deformity involves both the hard and soft palate. The amount of annoyance is in proportion to the extent of the fissure, and the width which exists between its contiguous borders, but even in the mildest cases the peculiarity of voice proclaims to the public the malformation, while in the more severe ones the great difficulty in deglutition, and the almost incapability of articulation, compel the sufferer often to shun society, and to avoid as much as possible the companionship of all but his immediate friends.

I think that I am justified in asserting that up to the year 1844, little benefit had accrued from surgical interference, and that the attempts of surgeons to close the fissures were generally unsuccessful, and that all the operative proceedings were uncertain, conducted, as they were, without defined ideas of the elements necessary to secure success. In that year, Mr. Fergusson, Surgeon to King's College Hospital, read before the Medical and Chirurgical Society a paper in which he clearly indicated the cause of failure, in the cases operated on, and suggested an operation based on purely anatomical grounds, for the closure of the fissure in the soft palate; and I may add that the large number of patients who have been successfully operated on, both by him and by other surgeons who have followed the steps advocated by him, clearly prove the truthfulness of the statements then made by Mr. Fergusson, and the efficiency of the method he recommended.

After detailing his mode of operating, he concludes his paper with these words :

"I need scarcely say that such an operation can be done only in the soft palate, but should the fissure extend further forward, as it often does, especially in cases of hare-lip, *the aperture in front must be afterwards closed with an artificial palate.*"

Dr. Warren, of Boston, U.S., described in a paper, a few years ago, an operation for closing the gap in the hard palate, and cited several cases which he had successfully treated; and since then, surgeons in England have frequently performed this operation, and in some instances with a most happy result. It is not, however, very often that fissures in the hard palate admit of an attempt to close them, for to do so with a probable chance of success two conditions are essential. 1st, that the gap should not be very wide; and 2d, that the soft tissues covering the bony roof of the mouth should be sufficiently thick and elastic to allow of their being brought together after they have been detached from the parts they cover. Hence it is that, in the majority of these cases, many of our most eminent surgeons are generally satisfied with closing the fissure in the soft palate, without submitting their patient to a painful proceeding to cover in the aperture in the hard, which may terminate in a failure. It is for the relief of this class of cases that the dentist is appealed to, and it becomes his duty to substitute an artificial palate in order to complete a cure which the surgeon has already commenced by uniting the free edges of the cleft in the soft structures.

I purpose now briefly to trace the history of the various mechanical contrivances which ingenuity has from time to time suggested for the relief of this terrible malformation, and to examine some of the different appliances which many of our forefathers, skilled in the mechanical art, had devised for the purpose of effecting that which they felt was beyond the power of the surgeon. It may be said of this, as indeed of all mechanical inventions, that its improvement has kept pace with the progress of time; and patients afflicted with deformities in the hard and soft palate, which are without the pale of surgical treatment, may now, by a well-adapted artificial roof to their mouths, constructed from a material which till within the last few years was unknown to man, enjoy all that art can furnish. Not only is the power of deglutition greatly improved, but a facility of articulation is given, which to many who suffer from such a calamity was before denied them. Mr. Sercombe, in a very excellent paper read before the Odontological Society of London, quoted a case which was published by Jaques Guillemeau, a Frenchman, in the year 1598, in which he speaks of "Two goulden roofes of the mouth which are made as thin as a French crown. They are composed to retain therewith the breathe from the roofe of the mouth, therebye to evite the speaking thro' the nose;" and he goes on to say, "that there are some which cannot suffice themselves with this plate, by reason that the gouldsmith cannot soe conveniently make the same that it equally of all sides doe touch the palate of the mouth, so that instead therefore they use a tent made of lint or sponge, to which intent there are divers which are provided of them, because that if the one fell out they have incontinently another in readiness and preparation to put therein, because otherwise they should speak through the nose."

Ambrose Paré, in 1665, mentions several cases fitted with artificial palates of much the same construction as those referred to by Jaques Guillemeau, only fitted with sponges on their upper surface, "which, when moistened with the moisture distilling from the brain, will become more swollen and puffed up, so that it will fill the concavity of the palate that the artificial palate cannot fall down, but stand fast and firm as if it stood by itself."

I need not relate the history of various cases which were attempted by Pierre Fouchet and others, at the termination of the last century, as they varied little from that of Jaques Guillemeau, and were exceedingly ineffective.

In the year 1828, a Mr. Snell published a work on this subject; he laid great stress on the importance of correct models to work by, and he declares that he was very successful in treating cases of fissure of the hard and soft palate by substituting gold plates, to the posterior margin of which he attached a thin curtain of india rubber, fixing the metal portion in its place by means of gold bands encircling the teeth.

In the 'Lancet' of July 5th, 1845, will be found the account of a very ingenious contrivance, by a Mr. C. H. Stearns, a surgeon, which he calls "an instrument designed to remedy the imperfection of speech consequent upon congenital fissure of the soft palate." He states that a near relation of his had twice been unsuccessfully operated upon for cleft palate, and had also submitted himself several times to the hands of dentists who professed to be able to close the fissure by the adaptation of mechanical contrivances. These measures not being attended with any success, he was determined to attempt something for his friend's relief. He had, therefore, a gold plate fitted to the roof of the mouth, to the posterior margin of which was attached a curtain of india rubber, so arranged as to glide over the lateral edges of the soft palate. This portion of the apparatus was rather complex, and at the same time weighty, but, according to the writer's account, it had the effect of materially improving the speech of the patient.

It appears to me that the addition of a pendulous flap of india rubber to a solid gold palate, although an apparent imitation of the normal condition of the roof of the mouth, is attended with one great objection—which is, that the soft palate is a moveable curtain, furnished with numerous muscles, and highly supplied with nerves, so that it can appreciate the most delicate bodies, and can, under the stimulation of food or the action of the will, alter the shape of the mouth either for the purpose of facilitating the passage of food into the pharynx, and preventing a portion of it passing into the nose, or for the admission of air into the windpipe.

Now, as mechanical art fails to supply either muscular or nervous power, I think that we best consult the comfort of our patient by furnishing him with an artificial palate of such a size that the cavity of the nose is shut off perfectly from the mouth, but which at the same time does not in any way interfere with the ingress and egress of air, and composed of such a material that great lightness and durability are conjoined, and endowed with an ability for resisting the chemical actions of the saliva or of the different fluids which are used in food. During the last few years I have devoted considerable attention in endeavouring to find out the form of artificial palate which gives the greatest ease, and in ascertaining what material combines in itself all those qualities which are essential for the comfort of the patient. After very many trials I am led to the conclusion that vulcanite, or vulcanized india-rubber, after it has been submitted to a great temperature, supplies us with a substance in many respects preferable to gold for repairing deficiencies in the hard palate, either after the soft palate has been closed by a surgical operation, or where surgical interference is inadmissible.

My reasons for arriving at this conclusion are—

1st. Vulcanite is extremely hard, receiving a very high polish, but at the same time it is highly elastic. It is exceedingly light, its specific gravity being but slightly greater than that of cork; so that in cases where large frames are required, either for the purpose of fixing at the same time artificial teeth, or for closing extensive fissures of the palate, this substance possesses a very great advantage over gold.

2d. It admits of a very high degree of workmanship, allowing its edges to be made exquisitely round and smooth, and thus contrasting very favorably with any metal plate, which, however finely finished, always presents hard points, which by pressing on the palate or gums forms a continual and frequently unbearable source of irritation.

3d. Vulcanite, in durability, is preferable to gold; for, from its extreme elasticity, if from any cause it sustains a fall, its fit will not be in any way impaired, whereas a similar accident would probably so alter a gold palate as to require it to be remodelled to the mouth.

4th. It is not affected by any acids or by any fluid or solid which can be taken into the mouth, nor is it liable to decay after having been worn for any length of time, and as it bears as perfect a polish as metal, it can be cleaned with equal facility, a little soap and water being all that is ever required.

I shall now, without further comment, give the results of a few cases in which I have applied vulcanized india-rubber to the formation of artificial palates and jaws, and let facts speak for themselves.

Case I.—Miss H— suffered from congenital fissure of both hard and soft palate. The gap was so wide as to place the case quite beyond the reach of any surgical assistance. She had worn a gold palate for many years, with tolerable comfort, but the loss of some of her teeth, and the consequent alteration in the shape of the upper maxilla, rendered her artificial palate almost useless. She at this time applied to me, and I fitted her with a palate of vulcanized india-rubber, which, from its extreme lightness, has much increased the comfort of the patient. Her powers of deglutition and speech have also much improved. This case has stood the test of many months, and may therefore be considered permanently successful.

Case II.—Mr. A— had been successfully operated on by Mr. Fergusson for congenital hare-lip and fissure of the palate. The cleft in the hard, however, still remained, and he was referred to me for the purpose of having a gold palate fitted to the gap. Having had already success in the application of india-rubber, I used it again, for this patient, and the result was such as to afford both the patient and myself the greatest satisfaction. The immediate improvement in the speech of this patient was most remarkable.

Case III.—Miss B— had previously had the soft palate successfully closed by Mr. Fergusson, but suffered great inconvenience from an aperture in the hard about the size of an almond. To this I applied the vulcanized india-rubber with the most complete success.

Case IV.—Miss H— had been operated on by Mr. Christopher Heath for hare-lip and fissure in the soft palate, with most perfect success; but a small aperture in the hard palate still remained, which caused great imperfection in speech. The improvement in talking was greater in this patient, after the application of the india-rubber palate, than in either of the preceding.

Case V.—Miss W—. Congenital fissure of both hard and soft palate, far too extensive to allow of surgical interference. I applied an india-rubber palate, which rendered speech and deglutition easy and natural.

Case VI.—Miss H—. A similar case to No. V, attended with an equally satisfactory result.

Case VII.—Miss H—. The soft palate had been successfully closed by Mr. Fergusson, but a considerable cleft remained in the hard. I here also applied india-rubber, with a success equal to any of my other cases.

Case VIII.—Eliza C— was operated on by Mr. Fergusson in May, 1856, when the greater part of the left upper maxilla was removed. As soon as the cicatrix had become sufficiently firm to bear pressure, I supplied the deficiency by a frame of vulcanized india-rubber, attaching to it those teeth which had necessarily been removed by the operation. The extreme lightness of the india-rubber rendered it most useful in a case of this kind, and the great comfort it has afforded to the patient has induced me to adopt a similar proceeding in other cases of a similar kind; amongst the most successful of which I may enumerate the following.

Case IX.—C. G—, aged fifty-eight, looking healthy and robust, was admitted into King's College Hospital, under the care of Mr. Fergusson, November 28th, 1859. The following is the history of the case, as supplied by Mr. Mason, the house-surgeon. The patient states that he has had good health until ten months ago, when he noticed a very small growth on the anterior part of the roof of the mouth. This gradually increased in size, and extended backwards, involving the palate. About nine weeks ago, he says, he removed the stump of a right bicuspid tooth; there was considerable hæmorrhage, and since then the gum in that position had become involved in the disease. When admitted there was found a ragged-looking growth involving the superior maxilla in the mesial line, the whole alveolar ridge behind the upper lip and the hard palate being affected. It was not tender to the touch, and did not interfere with mastication or deglutition. It bled a little sometimes; the glands in the neighbourhood were not affected. On December 3d, Mr. Fergusson first made an incision down the centre of the upper lip, and carried another into each nostril. He then dissected back the upper lip and the alæ nasi in one piece on each side. Curved cutting pliers were then used, and without much difficulty the mass (about the size of three walnuts) was removed. Considerable hæmorrhage took place from the cut surfaces of the wound, but was arrested by the actual cautery. The cut edges of the upper lip were then brought together, and kept in apposition by hare-lip pins.

In some remarks made after the operation, Mr. Fergusson stated that removal of one maxillary bone for disease was not uncommon, but it was rare to find disease implicating both. Mr. Fergusson directed attention to the incision by which he exposed the growth. It was desirable, he said, that the surgeon should leave as few marks of his doings as possible.

December 4th.—He is reported as having had no bleeding since the operation.

January 4th, 1860.—The subject of the above remarks left the hospital a week ago, all the parts being soundly healed; only a linear scar remained on the lip, but there was a large aperture in the hard palate communicating with the nasal cavity, through which everything he took, especially if of a fluid nature, passed, rendering his speech very imperfect and deglutition difficult. A month or two after he had left the hospital, Mr. Fergusson sent him to me to see if I could suggest anything for his relief. After carefully examining him, I thought it would be just the case for vulcanized india-rubber, and I at once made him a palate of this substance, fitting to it the teeth he had lost by the operation. His gratitude amply repaid me for the trouble. His speech was rendered *perfectly* natural; and instead of all fluids pouring through his nose directly he took them into his mouth, he was able to eat and drink with perfect comfort. A drawing of this case will be found in the frontispiece.

The last three patients illustrate in a remarkable manner the facility with which vulcanite can be accurately adapted to the deficiencies in the jaw caused by surgical operations—a class of cases which are far more difficult to cope with than the congenital fissure in the hard or soft palate, as each presents peculiarities of its own, and the dentist, guided by no definite laws, has to depend on the experience of his mechanical adjustments in other cases for selecting that form of artificial support which will afford the greatest amount of comfort.

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